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10/590,293	08/23/2006	Yusuke Murata	03500.125697.	6810

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EXAMINER	
NOGUEROLA, ALEXANDER STEPHAN	
ART UNIT	PAPER NUMBER
1795	
MAIL DATE	DELIVERY MODE
05/28/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/590,293	MURATA, YUSUKE	
	Examiner	Art Unit	
	ALEX NOGUEROLA	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 May 2010 (amndt.)*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-7* is/are rejected.

7)☒ Claim(s) *8 and 9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application.
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment of May 13, 2010 does not render the application allowable. They Iyer reference renders the pending claims obvious, as discussed below.

Status of the Rejections pending since the Office action mailed on February 18, 2010

2. All previous rejections are withdrawn.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1 and 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iyer et al. US 6,958,480 B1 (hereafter "Iyer", which was cited in the previous Office action).

Addressing claim 1, Iyer discloses a mesoporous silica structure having a plurality of mesopores, comprising:

a dendritic framework having mesopores, wherein the mesopores pass through the framework in a direction perpendicular to a longitudinal direction of the framework. See the abstract; Figures 1-9; col. 04-47 – col. 05:08; col. 06:22-57; col. 37-57; and claims 3 and 6.

Iyer does not specifically mention having 90% or more of the mesopores observable in a 500 nm x 500 nm area pass through the framework in a direction perpendicular to a longitudinal direction of the framework. However, these features are obvious over Iyer itself. As shown in Figure 1 and described in col. 05:44-56 Iyer discloses creating a highly ordered mesoporous silica structure having a dendritic structure in which many of the mesopores pass through the framework in a direction perpendicular to a longitudinal direction of the framework. Iyer further describes how

the mesopore diameter and structure dimensions, such as thickness may be controlled. See the abstract and col. 027-43. Thus, barring a contrary showing, such as unexpected results, to have 90% or more of the mesopores observable in a 500 nm x 500 nm area pass through the framework in a direction perpendicular to a longitudinal direction of the framework is just a matter of controlling the pore size, structure thickness, structure width, and structure length. More particularly, one with ordinary skill in the art at the time of the invention would recognize that as the structure thickness decreases relative to the surface area of the structure (assuming the structure is in the form of a film as shown in Figure 1 of Iyer) the percentage of mesopores perpendicular to the longitudinal direction of the framework will increase. Controlling the mesopore size allows the number of mesopores in a 500 nm x 500 nm area to be determined. So with a large, yet still mesporous pore size, and a very large structure surface area relative to the structure thickness the feature of having 90% or more of the mesopores observable in a 500 nm x 500 nm area pass through the framework in a direction perpendicular to a longitudinal direction of the framework could be readily achieved. In sum, the newly claimed features are just a matter of adjusting dimensions of the mesoporous structure, particularly pore size, and structure thickness, width, and length, which Iyer discloses how to do.

Addressing claims 3 and 4, for the additional limitations of this claim see Iyer Figure 1 and col. 05:44-56.

Addressing claim 5, Iyer does not specifically mention setting the pore size distribution so that 80% or pore of the mesopores fall within a range having a width of 10 nm and a maximal value; however, Iyer discloses that with his manufacturing method the pore sizes can be largely only one size, such as 4 nm or 8 nm, or a controlled range of sizes from 1 nm to 50 nm. See col. 03:26-30; col. 05:33-35; col. 07:57-60. Thus, to set the pore size within the claimed range is, barring a contrary, showing a mere change in size, so to speak, that one with ordinary skill in the art at the time of the invention could accomplish using the disclosure of Iyer.

Addressing claim 6, Iyer does not specifically mention supporting a biological material in the mesopores; however, Iyer discloses and claims using the structure as a sample holder for desorption/ionization mass spectrometry. See col. 01:10-15 and claims 13 and 15. It would have been obvious to one with ordinary skill in the art at the time of the invention to use support biological material in the mesopores because as noted Iyer discloses and claims using the structure as a sample holder for desorption/ionization mass spectrometry and Iyer in discussing desorption/ionization mass spectrometry mentions that it is useful for studying biomolecules, such as proteins. See col. 01:52-58 and col. 02:63 – col. 03:03.

Addressing claim 7, Iyer discloses a mesoporous silica structure having a plurality of mesopores, comprising:

a dendritic framework having mesopores, wherein the mesopores pass through the framework in a direction perpendicular to a longitudinal direction of the framework. See the abstract; Figures 1-9; col. 04-47 – col. 05:08; col. 06:22-57; col. 37-57; and claims 3 and 6.

Iyer does not specifically mention having 90% or more of the mesopores observable in a 500 nm x 500 nm area pass through the framework in a direction perpendicular to a longitudinal direction of the framework. However, these features are obvious over Iyer itself. As shown in Figure 1 and described in col. 05:44-56 Iyer discloses creating a highly ordered mesoporous silica structure having a dendritic structure in which many of the mesopores pass through the framework in a direction perpendicular to a longitudinal direction of the framework. Iyer further describes how the mesopore diameter and structure dimensions, such as thickness may be controlled. See the abstract and col. 027-43. Thus, barring a contrary showing, such as unexpected results, to have 90% or more of the mesopores observable in a 500 nm x 500 nm area pass through the framework in a direction perpendicular to a longitudinal direction of the framework is just a matter of controlling the pore size, structure thickness, structure width, and structure length. More particularly, one with ordinary skill in the art at the time of the invention would recognize that as the structure thickness decreases relative to the surface area of the structure (assuming the structure is in the form of a film as shown in Figure 1 of Iyer) the percentage of mesopores perpendicular

to the longitudinal direction of the framework will increase. Controlling the mesopore size allows the number of mesopores in a 500 nm x 500 nm area to be determined. So with a large, yet still mesporous pore size, and a very large structure surface area relative to the structure thickness the feature of having 90% or more of the mesopores observable in a 500 nm x 500 nm area pass through the framework in a direction perpendicular to a longitudinal direction of the framework could be readily achieved. In sum, the newly claimed features are just a matter of adjusting dimensions of the mesoporous structure, particularly pore size, and structure thickness, width, and length, which Iyer discloses how to do.

As for having the porous material formed into a plurality of particles having a mesoporous structure as described above this appears to be just requiring a plurality of such mesoporous structures. If not already disclosed by Iyer, to provide a plurality of particles as claimed is either just mass manufacturing of the structures of Iyer or just a matter of creating an assortment of structures with different pore sizes so that the structure must appropriate or optimum for laser adsorption/ionization mass spectrometry of different samples of interest will be available.

Claim Objections

5. Claim 7 is objected to because of the following informality: -- into -- be inserted between "formed" and "a" in line 1. Appropriate correction is required.

Allowable Subject Matter

6. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

a) Claim 8 - the combination of limitations requires the porous material of claim 7 to be in a sensor also comprising an electrode, the sensor detecting an electric output signal based on a reaction between the specimen and a biological material supported in the mesopores. Iyer only discloses using the mesoporous silica as a sample holder for laser desorption/ ionization mass spectrometry. See the Iyer abstract; col. 01:10-16; and col. 03:40-54.

b) Claim 9 - the combination of limitations requires

preparing a sensor in which a biological material is supported in the mesopores

of the structure according to claim 1;
applying a fluid that contains a specimen to the sensor; and
detecting an output signal based on a reaction between the biological material
and the specimen.

In Iyer the biological materials supported in the mesopores of the structure according to claim 1 is the specimen. Iyer only discloses using the mesoporous silica as a sample holder, such as for a biological specimen, for laser desorption/ ionization mass spectrometry. No reaction between the specimen and biological material occurs within the mespores of the structure as used in Iyer. See the Iyer abstract; col. 01:10-16; col. 01:51-65; and col. 03:40-54.

Final Rejection

8. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (571) 272-1343. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Alex Noguerola/
Primary Examiner, Art Unit 1795
May 26, 2010